

Preventing damages, protecting facilities, and ensuring water deliveries


Economic and environmental chaos can result when non-native plants and animals invade areas with few or no natural predators. These pests damage our infrastructure; obstruct flow; prevent access for maintenance and recreation; cause structural damage; and harm system operations, water quality, and habitat. The annual dollar value of lost irrigation water is estimated as high as \$288 million, and the annual dollar value of lost power generation along the Colorado River alone is estimated to be as great as \$43.5 million. Reclamation must combat these invasive species to protect our facilities and ensure water delivery.

Invasive species cost the U.S. economy hundreds of millions of dollars a year. Each day, noxious weeds (like leafy spurge and yellow star thistle) move into about 4,600 acres, choking out native plants and punching an economic whallop of about \$140 million a year. Thirsty exotic species like salt cedar with 100-foot-deep roots “drink” critical water supplies and choke out native habitats along rivers. Salt cedar spread rapidly over the past 30 years and consumes an estimated 2.5 million acre-feet of water a year in the west. Purple loosestrife chokes waterways and wetlands, causing an estimated \$46 million in damages a year.

Reclamation’s Science and Technology Program is attacking the problem on several fronts. We study the life cycle of a species to determine the best times to move against it to prevent spreading and reproduction. To determine optimal ways to combine and use techniques, we are examining traditional pest management methods such as herbicides and mechanical controls. For example, cutting the plant at the root and then spraying the remaining stem with pesticides may be most effective. However, traditional methods can be costly and environmentally damaging.

Reclamation’s Science and Technology Program seeks out the species’ natural enemies and finds ways to safely use these enemies to control invasive species. Often, we can find predators that rely solely on that plant or animal and will eat nothing else. We do extensive tests to ensure that adding this predator won’t harm the environment. After this, we can introduce that predator into the ecosystem to bring the invasive species into a controlled equilibrium.

Reclamation released insects that eat only purple loosestrife at the Winchester Wasteway, where dense growth threatened to block waterflows and vital habitat. The insects and loosestrife reached a balance where both are present at low levels. Because of this research, control costs were reduced to \$20,000 for an initial treatment and a few thousand dollars a year to apply and monitor the insects in a similar situation. This is less than one-fifth of the cost of traditional treatment with herbicides.



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Such findings, coupled with knowledge about the species, help Reclamation facility managers develop effective integrated pest management plans. The program helps local facility operators to develop and implement these plans. As new technology becomes available, the program shows operators how to use and understand these new control methods.

The Science and Technology Program provides technical assistance, special studies, and demonstration projects to promote integrated pest management concepts and to solve specific pest problems. Demonstrations at Reclamation's facilities show how effective these technologies can be and how operators can adapt the technology to Reclamation's operation patterns and practices. For example, insects that control leafy spurge were only tested in weed patches shaped in circles and squares. Yet Reclamation's irrigation canals and rights-of-way are long, narrow corridors. Our research showed that insects respond to long linear strips of weeds in the same way they would to a large circular patch. By understanding how predatory insects disperse, we can establish the most effective release patterns that minimize costs and maximize effectiveness.

Reclamation is working with many partners to monitor and counter the continual threat from established and new invasive species. Through this cooperation, we can protect our facilities, the environment, and the Nation's economy from these hordes of invaders.



The Science and Technology Program is working on the outbreak of Giant Salvinia in the Palo Verde Irrigation District drainage system in Reclamation's Lower Colorado Region. We are demonstrating ways to eradicate the menace and rehabilitate the drains.

"Had we used herbicides to control the 24,000 plus acres of purple loosestrife at the Winchester Wasteway, it would have cost \$100,000 for material and labor—not to mention the costs for NEPA and other regulatory compliances. Now we are working together on biocontrol agents for thistles, knapweeds, saltcedar, leafy spurge, and others. This work will help our noxious weed control program in the future." Wes Green, Management Agronomist, Pacific Northwest Region

Jim Gaza, Central Arizona Project, aqueduct maintenance foreman, praises the research, "The work Reclamation did in developing an aquatic weed management program using triploid grass carp saves \$1 million dollars a year."



The Science and Technology Program is demonstrating new methods to eradicate salt cedar with insects that only eat salt cedar. In 2001, researchers started testing this potentially effective, low-cost, and environmentally friendly method of eradication at sites along the Arkansas River.